

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): ~~—Mechanical~~ A mechanical part made of steel ~~deriving~~ derived from the hot ~~forge~~ forging or the cold ~~press~~ pressing thereof, of medium or small size, and resulting from plastic transformation of a long siderurgical semiproduct, ~~characterized in that~~ which the steel of which it is composed has a composition that, besides iron and the inevitable residual impurities resulting from processing of the steel, corresponds at least to the following analysis, given in weight percentages:

0.2	≤	C	≤	0.5 ₁
0.5	≤	Mn	≤	2.0 ₁
0.05	≤	V	≤	0.5 ₁
0.6	≤	Si	≤	1.5 ₁
0.05	≤	Cr	≤	1.0 ₁
0.01	≤	Mo	≤	0.5 ₁ <u>and</u>
0.02	≤	S	≤	0.10 ₁

and ~~possibly~~ optionally up to 50 ppm of boron, wherein
~~and in that the said~~ part is obtained from a long semiproduct ~~deriving~~ derived from continuous casting and ~~hot-rolled~~ hot-rolling in the austenitic area, then formed by plastic deformation and treated thermally in order to obtain a metallographic structure containing essentially acicular ferrite at least in the zones of mechanical stressing in tenacity and fatigue.

Claim 2 (Currently Amended): ~~—Mechanical~~ The mechanical part according to claim 1, ~~characterized in that~~ wherein the steel ~~which constitutes it furthermore contains~~ further comprises from 0.01 to 0.02% titanium and/or up to 0.20% aluminum.

Claim 3 (Currently Amended): ~~—Mechanical~~ The mechanical part according to claim 1 ~~or 2, characterized in that~~ wherein the steel ~~which constitutes it furthermore~~ further comprises between 5 and 30 ppm of calcium.

Claim 4 (Currently Amended): ~~—Steel~~ A steel for the manufacture of a mechanical part by plastic deformation, ~~characterized in that~~ wherein, besides the inevitable residual impurities resulting from processing of the steel, its chemical composition comprises at least, expressed in weight content:

$$\begin{array}{llll} 0.2 & \leq & C & \leq & 0.5, \\ 0.5 & \leq & \text{Mn} & \leq & 2.0, \\ 0.05 & \leq & V & \leq & 0.5, \\ 0.6 & \leq & \text{Si} & \leq & 1.5, \\ 0.05 & \leq & \text{Cr} & \leq & 1.0, \\ 0.01 & \leq & \text{Mo} & \leq & 0.5, \text{ and} \\ .02 & \leq & S & \leq & 0.10, \end{array}$$

and ~~possibly~~ optionally up to 50 ppm of B, wherein
~~and in that~~ the metallographic microstructure that ~~it~~ the steel will have, once the ~~said~~ part is implemented, is essentially composed of acicular ferrite at least in the zones of the part subjected to mechanical stressing in tenacity and fatigue.

Claim 5 (Currently Amended): ~~Steel~~ The steel according to claim ~~4~~ 5 or 6, ~~characterized in that~~ wherein, in order to protect the vanadium, it ~~furthermore contains~~ the steel further comprises from 0.01 to 0.02 % titanium and/or up to 0.20% aluminum.

Claim 6 (Currently Amended): ~~Steel~~ The steel according to claim 4 ~~or 5~~,
~~characterized in that it furthermore comprises~~ further comprising between 5 and 30 ppm of
calcium.

Claim 7 (Currently Amended): ~~Process~~ A process for the manufacture of a
mechanical part made of steel, ~~characterized in that~~ wherein, for the purpose of obtaining
acicular ferrite at least locally on the ~~said~~ part, ~~it~~ the process comprises the following stages:

~~—there is provided~~ providing a continuous casting billet made of steel with a
composition according to ~~the analysis given hereinabove~~ claim 4, which is hot-rolled at a
temperature in excess of 1000° C into a bar or wire before being cooled to room temperature
after rolling;

~~—the wire being subjected~~subjecting the wire to a controlled cooling prior to its
formation into rings ~~for the obtaining of~~ to obtain a metallographic structure composed
essentially of acicular ferrite, which wire then is cut into pieces and cold-pressed into a
finished part ready for use; and

~~—the bar itself being cooled~~cooling the bar naturally in the rolling heat prior to its
cutting the bar into pieces which then are hot-forged into a rough shape of a part that is
cooled by controlled cooling ~~for obtaining of~~ to obtain a structure essentially composed of
acicular ferrite at least in the stressed zones of the part, which rough shape then is machined,
as need be, to the desired dimensions to make it into a finished part ready for use.

Claim 8 (Currently Amended): ~~Process~~ The process according to claim 7,
~~characterized in that~~ wherein the controlled cooling is a natural cooling to room temperature.

Claim 9 (Currently Amended): —~~Process~~ The process according to claim 7,
~~characterized in that~~ wherein the controlled cooling is a forced cooling ensuring a surface
cooling speed of approximately 0.5 to 15° C/s.

Claim 10 (Currently Amended): —~~Long~~ A long, medium carbon siderurgical
semiproduct, intended to be transformed by forge or by press into a mechanical part with high
characteristics, of small size or of medium size, ~~characterized in that~~ wherein, in order that
the ~~said~~ part may have a metallographic microstructure essentially composed of acicular
ferrite at least in the zones of the part subjected to mechanical stressing in tenacity and
fatigue, the steel that constitutes it the part corresponds at least to the following analysis,
given in weight percentages:

$$\begin{array}{llll} 0.2 & \leq & C & \leq & 0.5, \\ 0.5 & \leq & \text{Mn} & \leq & 2.0, \\ 0.05 & \leq & V & \leq & 0.5, \\ 0.6 & \leq & \text{Si} & \leq & 1.5, \\ 0.05 & \leq & \text{Cr} & \leq & 1.0, \\ 0.01 & \leq & \text{Mo} & \leq & 0.5, \text{ and} \\ 0.02 & \leq & S & \leq & 0.10, \end{array}$$

and ~~possibly~~ optionally up to 50 ppm of boron, wherein
~~and in that~~ the metallographic microstructure that it will have after transformation will be
essentially composed of acicular ferrite at least in the zones of the part subjected to
mechanical stressing in tenacity and fatigue.